Cost-Effective ISS Space-Environment Technology Validation of Advanced Roll-Out Solar Array (ROSA), Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

Effort proposed is for detailed planning, configuration and hardware definition of a low-cost, but high technology payoff, ISS-based flight experiment that will allow key relevant space-flight environmental validation of our innovative Roll-Out Solar Array (ROSA) technology/ hardware. The ROSA flex-blanket solar array technology provides game-changing affordability and performance, and delivers a performance paradigm shift in terms of: significantly lower cost, greater specific power, more compact stowage volume, higher structural performance, deployment reliability, less complexity, and higher modularity & scalability than state-of-the-art solar arrays; for NASA deep space planetary exploration/science, high-power solar electric propulsion (SEP) Tugs and Exploration vehicles, commercial orbital transportation and resupply (COTS, CRS)missions. The critical and necessary aspect of readying the enabling ROSA technology for infusion into these applications is to increase the TRL to 7+ via test-validation of hardware in a relevant spaceflight environment provided by ISS (and supporting scalable predictive model validations) for three key ROSA technology advance areas critical to solar array implementation by end-users: Deployment Kinematics, Deployed Dynamics Behavior and Photovoltaic Power Production / Survivability. The ISS provides a ready and cost-effective relevant space environment (zero-G, vacuum and solar illumination/thermal) test-bed for the validation of these key ROSA technology areas via the straightforward flight experiment proposed. The proposed ROSA ISS flight experiment will leverage off of existing ground-based hardware test / analysis efforts to continue the systematic ROSA technology maturation, risk mitigation and TRL advancement to level 7+, through space-environment validations of a ROSA prototype-experiment flight wing's function and performance. It will also allow generation of flight validated, scalable, TRL 7+ predictive models.

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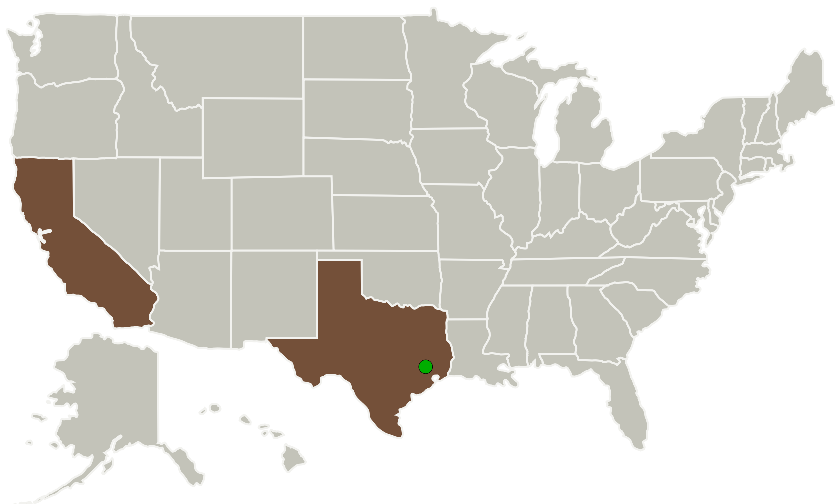
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
California	Texas

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140268)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

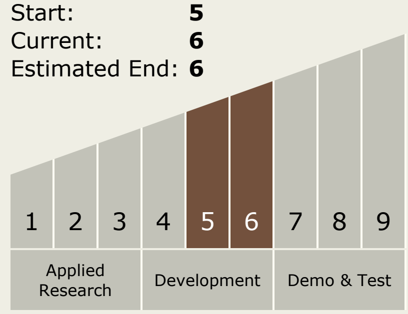
Carlos Torrez

Principal Investigator:

Steve White

Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - └ TX03.1 Power Generation and Energy Conversion
    - └ TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System